(R – 2) Why Salinity Management is Important

Salinity: **The major solutes comprising the dissolved salts are the cations (ions with a positive charge) of calcium, magnesium & sodium (potassium exist in very small amounts). The anions (ions with a negative charge) include sulfate, chloride, & bicarbonate (minor amounts of anions include: carbonate, nitrate, fluoride, phosphate, borate & silicate). All combined, the proportion of each of these dissolved mineral solute determines the suitability of water for irrigation.**

There are four rules regarding irrigation and salinity that need to be understood[1/]:

- **Rule #1: All waters used for irrigation contain salts of some kind in some varying amounts**
- **Rule #2: Salinization of soil and water is inevitable to some extent**
- **Rule # 3: An irrigated agroecosystem cannot be sustained without some drainage, either natural or artificial**
- **Rule # 4: Rules 1 though 3 can't be changed**

Major reasons & strategies for salinity management:

- **Sustainability of irrigated agriculture**
- **Protect surface and ground water quality**
- **Water conservation requires it**
- **Increased energy cost to pump water requires efficient irrigation systems that can leach salts to acceptable levels**
- **To prevent salinization**
- **Increased costs of soil amendments demand their judicious use**
- **Water resources (quantity and quality) are becoming more limited**
- **Increased irrigation efficiencies require greater salt management**
- **To prevent soil erosion and protect and improve soil quality**
- **Significant portions of the world's irrigated land are affected by salinity**
- **Lands degraded by salinity must be restored and reclaimed in order to increase crop productivity & quality**
- **Is a major component of an IWM Plan (i.e., leaching requirement)**
- **Salinity levels must be monitored to ensure that IWM practices are providing an optimal crop growing environment**
- **Planting & tillage strategies can be developed to prevent excessive salinity accumulation in the root zone**
- **Crops are most affected at the germinate and young seedling stage (Critical to manage at this stage)**
- **Depending on water quality, foliar injury (salt burn) is caused by leaf absorption of excess concentrations of sodium and chloride**
- **Needed to plan, design and manage irrigation systems to meet crop consumptive use & salinity leaching requirements**
- **IWM Plan must account for the crops unique salt tolerance**
- **To use appropriate reclamation strategies & amendments for reclaiming Saline, Sodic & Saline-Sodic soils**
- **To select suitable salt tolerant crops that are appropriate for existing water quality/quantity and irrigation systems**
- **To ensure a suitable drainage requirement for given water quality, crop salt tolerance and leaching requirement (e.g., depth to water table, soil texture/structure, etc.)**
- **To ensure that leaching is not required until accumulated soil salinity surpasses the salt tolerance threshold for the crop**

1/ NRCS Salinity Management for Soil & Water (pg. 1.28); Additional Ref.: NRCS Conservation Practice (610): Toxic salt reduction

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